

**IN THE UNITED STATES PATENT & TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant(s):	Kevin R. Keegan et al.)	Examiner:	I. Akram
)		
Serial No.:	10/801,740)	Art Unit:	1795
)		
Filed:	March 16, 2004)	Confirmation No.	1846
)		
For:	REFORMER START-UP STRATEGY)		
	FOR USE IN A SOLID OXIDE FUEL)		
	CELL CONTROL SYSTEM)		
)		

REPLY BRIEF UNDER 37 C.F.R. § 41.41

Mail Stop Appeal Brief - Patents

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a reply to the Examiner Answer ("Answer") mailed on December 7, 2009 responding to the Appeal Brief filed on August 31, 2009.

On page 7, lines 17-19 of the Answer, the Examiner stated that claim 6 "simply states that 'the fuel combustion time interval is at least dependent on a starting temperature of a catalyst in said reformer.'" Appellants agree with the Examiner statement, but would like to reiterate the entire portion of claim 6 that is in issue to put the above-referenced phrase in context. Claim 6 is a catalytic hydrocarbon reformer including a software construct for determining a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer to a minimum reforming temperature, wherein the fuel combustion time interval is at

least dependent on a starting temperature of a catalyst in the reformer. In other words, the above-referenced software construct determines the amount of time that fuel combustion is necessary in order to bring the reformer to a minimum reforming temperature, taking into account the starting temperature of the catalyst in the reformer.

On page 7, lines 20-22 of the Answer, the Examiner stated that the Yamaoka reference "discloses both the measuring of the time necessary for temperature changes in the fuel (paragraph 50) and that these temperatures and times are related to the catalyst temperature (paragraph 8)." First, to Appellants' knowledge, this is the first time the Examiner has cited to paragraph [0008] of the Yamaoka reference. Therefore, Appellants have not previously commented on this paragraph.

Second, Appellants submit that while the temperature of the raw fuel vapor may have an affect on the temperature of the catalyst, neither paragraph [0050] nor paragraph [0008] discloses or suggests how it is determined that the catalyst has reached a minimum reforming temperature. It is possible that the system in the Yamaoka reference uses a temperature sensor on the catalyst surface, as in the prior art, and determines that a minimum reforming temperature has been reached when the temperature sensor indicates such. *See Specification*, pg. 2, lines 6-9.

Further, paragraph [0050] of the Yamaoka reference states that the target temperature of the raw fuel vapor flowing to the reforming catalyst is controlled by the amount of air flow that is combined therewith in order to prevent over-

heating or under heating of the raw fuel vapor. The language of claim 6 does not relate to determining how long it will take to heat the raw fuel to a reforming temperature, but instead relates to determining the amount of time that combustion must take place in order to pre-heat the catalytic reformer to a minimum reforming temperature. The amount of time that it will take to heat the raw fuel to a reforming temperature does not necessarily correlate to the amount of the time it will take for the catalytic reformer to reach a minimum reforming temperature. The time intervals for heating the raw fuel compared to heating the catalytic reformer may be based on independent factors. For example, the composition of the raw fuel and the reformer catalyst are different and therefore will heat up at different rates.

Moreover, there is nothing disclosed in paragraph [0050] of the Yamaoka reference that indicates that a starting temperature of the reformer catalyst is used to determine how long to pre-heat the hydrocarbon catalytic reformer so it reaches its minimum reforming temperature, as recited in claim 6. The only temperature mentioned in paragraph [0050] of the Yamaoka reference that relates to the reformer catalyst is its activation temperature, not a starting temperature.

On page 8, lines 6-9 of the Answer, the Examiner stated that the Yamaoka reference "measures and calculates times necessary for fuel to reach its desired temperature and the catalyst to reach its activating temperature (paragraph 8)." In response, Appellants disagree that paragraph [0008] of the Yamaoka reference discloses or suggests that the time necessary for the catalyst to reach

its activating temperature is calculated. While paragraph [0008] of the Yamaoka reference states that the catalyst has an activating temperature, nothing in paragraph [0008] states that a time interval is calculated for the catalyst to reach its activating temperature. As stated above, it is possible that the system in the Yamaoka reference uses a temperature sensor on the catalyst surface, as in the prior art, to determine that a minimum reforming temperature has been reached. *See Specification*, pg. 2, lines 6-9; *see also id.* at pg. 2, lines 9-26.

The Examiner has failed to provide any evidence in the Yamaoka reference to indicate that a software construct is used to determine the amount of time that fuel combustion is necessary in order to bring the reformer to a minimum reforming temperature, taking into account the starting temperature of the catalyst in the reformer, as recited in claim 6. Absent evidence to the contrary, it appears that the Yamaoka reference is utilizing nothing more than the prior art methods of determining when the catalyst will reach a minimum reforming temperature. *See Specification*, pg. 2, lines 6-24.

On page 8, lines 21-22 of the Answer, the Examiner stated that Appellants asserted that the Dalla reference does not disclose step f) of claims 1, 10 and 15. In response, Appellants submit that it was not stated that only step f) was not disclosed in the Dalla reference; instead, it was stated that the combination of steps f) and g) are not disclosed in the Dalla reference. Appellants included step f) in the argument to give perspective on the language recited in step g).

On page 9, lines 5-8 of the Answer, the Examiner states that paragraph [0064] of the Dalla reference discloses the importance of a starting temperature

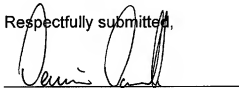
of the catalyst in determining whether the catalyst has achieved the desired temperature necessary for reforming to occur. First, to Appellants' knowledge, this is the first time the Examiner has cited to paragraph [0064] of the Dalla reference. Therefore, Appellants have not previously commented on this paragraph.

Second, Appellants submit that paragraph [0064] of the Dalla reference does not disclose the importance of the starting temperature of the catalyst in determining whether a minimum reforming temperature has occurred. Specifically, paragraph [0064] states that "fuel is first added to fuel injector 610, which heats up reforming catalyst 614 to the desired temperature." Paragraph [0064] goes on to state that "[w]hen the temperature of catalyst 614 is within the desired range and a reducing mixture is required, fuel is injected via injectors 602 at an equivalence ratio close to 1.0." Neither of these statements in paragraph [0064] of the Dalla reference disclose or suggest that a starting temperature of a catalytic reformer is used in a software construct to produce a fuel combustion time interval for pre-heating a catalytic reformer. While the temperature of the catalyst may be measured for the purpose of the warm-up and reformation process, Appellants submit that it is possible the Dalla reference is simply using the prior art methods of determining when the catalyst has reached a minimum temperature that were discussed in the background of the invention section of the present patent application. See *Specification*, pg. 2, lines 6-24; see also *Appeal Brief* at pgs. 15-16.

For the reasons set forth above, in addition to the reasons presented in the Appeal Brief, Appellants submit that the references of record fail to teach or suggest every limitation disclosed in claims 1-19, and request that the rejections of these claims be reversed.

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Respectfully submitted,



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